UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,648	09/12/2003	Dorothy D. Lin	2875.0120002	9489

26111 7590 10/07/2008

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

EXAMINER	
WONG, LINDA	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
10/07/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/661,648	Applicant(s) LIN ET AL.	
	Examiner LINDA WONG	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 29 September 2008.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-21 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-21 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Response to Arguments

Rejection under 35 USC 112, second paragraph

1. Applicant's arguments, see Applicant's Arguments, filed 9/29/2008, with respect to the 35 USC 112, second paragraph, rejection have been fully considered and are persuasive. The rejection of claim 18 has been withdrawn.

Rejections under 35 USC 103

2. **Regarding claim 1**, applicant's arguments filed 9/29/2008 have been fully considered but they are not persuasive.

   a. The applicant contends

   > The Office Action unequivocally states that Fielding "fails to disclose components of the satellite modem." *(see,* Office Action, Page 3). However, the Office Action alleges that the combination of Brooks and Alessi provides the missing teachings or suggestions with respect to claim 1. For the reasons to be discussed below, the combination of Brooks and Alessi does not teach or suggest each and every feature of claim 1. For example, the combination of Brooks and Alessi does not teach or suggest at least the feature of "a turbo decoder coupled to the burst demodulator and the DOCSIS MAC for decoding demodulated data l~om the burst demodulator and sending decoded data to the DOCSIS MAC, wherein the DOCSIS MAC sends DOCSIS management packets portion of the decoded data to the host processor and sends transmit packet data portion of the decoded data to the at least one data network" as recited by claim 1. Fielding does not provide the missing teachings or suggestions with respect to claim 1, nor does the Office Action allege that Fielding provides the missing teachings or suggestions with respect to claim 1 to render claim 1 obvious. Therefore, the Office Action fails to disclose a *prima facie* case of obviousness.

   A cable modem of Brooks "utilizes the Advanced System Bus (ASB 210) and Advanced Peripheral Bus (APB 214) protocol and bus architecture as specified in the Advanced Microcontroller Bus Architecture (AMBA) specification." *(see,* Brooks, para. [0032]). The "ASB 210 is the bus on which the first and second processors 102 and 104, RAM memory 106, and other direct memory access (DMA) devices reside." *(see,* Brooks, para. [0034]). According to Brooks,

   > [a]n ASB arbiter 218 determines which ASB master has access to the ASB 210. In this embodiment, there are four ASB masters capable of

> requesting the ASB 210: the first processor 102, the second processor 104, [a] host interface 122, and [a] DMA controller 212.
>
> *(see,* Brooks, para. [0039]).

The host interface 122 "supports a slave mode which provides an external host processor access to its internal memory, as well as memory-mapped register set." *(see,* Brooks, para. [0040]). An "ASB decoder 220 is also coupled to the ASB 210." *(see,* Brooks, para. [0041]). The ASB decoder 220 "decodes addresses on the ASB 210, and provides selection signals to each ASB slave." *(see,* Brooks, para. [0041]).

Alessi discloses "the use of [DOCSIS] in a military environment that uses Space Ground Link Interface Units (SGLIUs) to extend the DoD's terrestrial networks via multipoint radio communication channels." *(see,* Alessi, abstract). According to Alessi, some "modifications to DOCSIS may be necessary." *(see,* Alessi, abstract). For example, "DOCSIS currently uses Reed-Solomon coding, whereas military applications might prefer more powerful codes, such as Turbo Product Codes [(TPCs)]." *(see,* Alessi, abstract). TPCs "are iterative techniques that code data blocks as 2-D or 3-D matrices" *(see,* Alessi, Page 83, lines 29-30). TPCs "use simple coding schemes such as parity checks or Hamming codes along each axis of the matrix, so that each data bit has error correction coding covering it in two or three dimensions." *(see,* Alessi, Page 83, lines 30-34). Therefore, Alessi merely discloses a type of error correction code.

Hence, combining the ASB decoder 220 of Brooks with the TPC of Alessi at most teaches or suggests *a decoder to decode addresses* on an Advanced System Bus using Turbo Product Codes. Clearly, the aforementioned combination of Brooks and Alessi does not teach or suggest "a turbo decoder coupled to the burst demodulator and the DOCSIS MAC *for decoding demodulated data from the burst demodulator* ***and*** *sending decoded data to the DOCSIS MAC'* as recited by claim 1.

The examiner respectfully disagrees. Alessi et al discloses “The DOCSIS standard should be enhanced to allow for the implementation of additional FEC schemes such as Turbo Product Codes. However, to provide efficient operation in a variety of environments, DOCSIS should allow for a variable FEC scheme that can adapt to the immediate RF environment and can use different techniques as appropriate." (Conclusions and Recommendations) Alessi et al indicates the DOCSIS would be improved by using Turbo Product codes or Turbo decoding within a FEC component or decoder. Alessi et al also indicates improving the DOCSIS further by incorporating a variable FEC scheme allow for

use of different techniques when appropriate. As explained in the "Error Correction for DOCSIS Application to SGLIU" section, Turbo Product Codes perform remarkably well within high BER environments. Thus, by having a variable FEC scheme for performing different techniques when appropriate, and given a high BER environment, Turbo Product Codes or Turbo decoding can be used for error correction for better performance. As indicates by Alessi et al, incorporating or upgrading the decoder connected to the Advanced System Bus (ABS decoder) as disclosed by Brooks et al to perform different techniques specifically for different environments, such as Turbo Product Codes or Turbo decoding within a high BER environment as disclosed by Alessi et al would add variety to the decoder as well as efficient operation in a variety of environments, increasing the probability of error correcting the signal received.

b. The applicant further contends

Further, it appears to the Applicant that the Examiner developed this argument after reading Applicants' instant specification, i.e., through hindsight. Thus, there is no motivation to apply the combination of Fielding, Brooks, and Alessi as done in the Office Action absent the use of impermissible hindsight by the Examiner. *(see, KSR v. Teleflex,* 550 U.S. __ (2007) (stating that a "factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning."); *Interconnect Planning Corp. v. Feil,* 777 F.2d 1132, 227 U.S.P.Q 543 (Fed. Cir. 1985) (stating that when prior art references require selective combination to render obvious a subsequent invention, it is an error to reconstruct the patentee's claimed invention using the patentee's claims as a blueprint, there must be other motivation.); *In re Gorman,* 933 F.2d 982, 18 U.S.P.Q.2d 1885 (Fed. Cir. 1991) (stating it was impermissible to use applicant's structure as a template to select elements from a reference or references to fill in the gaps); *Para-Ordnance Manufacturing, Inc. v. SGS Importers International, Inc.,* 73 F.3d 1085, 1087, 37 U.S.P.Q.2d 1237, 1239 (Fed. Cir. 1995) ("Obviousness may not be established using hindsight or in view of the teachings or suggestions of the inventor.")). Thus, the combination of Fielding, Brooks, and Alessi cannot be used to form *aprima facie* case of obviousness.

The examiner respectfully disagrees. As shown in the rebuttal above, Alessi et al clearly discloses motivation for using a “variable FEC scheme that can be adapted to the immediate RF environment, and can use different FEC techniques” would improve the DOCSIS. (Conclusions and Recommendations) This indicates motivation for obvious combination of Brooks et al and Alessi et al, per the KSR ruling, would be appropriate.

Based on the rebuttal above, the rejection of claim 1 stands as stated. A copy is provided below.

3. Regarding **claims 2-13**, the applicant contends the combination of the prior arts does not render claim 1 obvious, thus the dependent claims is likewise not rendered obvious.

The examiner respectfully disagrees. As per the rebuttal stated above, Alessi et al and Brooks et al, in combination, disclose all recited limitations of claim 1. Thus, the rejection stated in office action mailed 6/27/2008 stands as stated. A copy is provided below.

4. Regarding **claim 18**, the applicant provides the same arguments as for claim 1. Please refer to the rebuttal above. Due to the rebuttal of claim 1, the rejection of claim 18 stands as stated. A copy is provided below.

5. Regarding **claims 19-21**, the applicant contends the combination of the prior arts does not render claim 1 obvious, thus the dependent claims is likewise not rendered obvious.

The examiner respectfully disagrees. As per the rebuttal stated above, Alessi et al and Brooks et al, in combination, disclose all recited limitations of claim 1. Thus, the rejection stated in office action mailed 6/27/2008 stands as stated. A copy is provided below.

6. Regarding **claim 14**, the applicant contends

> For the reasons to be discussed below, the combination of Quigley and Alessi does not teach or suggest each and every feature of claim 14. For example, the combination of Quigley and Alessi does not teach or suggest at least the features of "turbo decoding the QPSK output signal" followed by "decoding the turbo decoded output signal by a Reed-Solomon (RS) decoder" as recited by claim 14. In other words claim 14 recites two separate decoding steps. A first decoding step of "turbo decoding the QPSK output signal" followed by a second decoding step of "decoding the turbo decoded output signal by a Reed-Solomon (RS) decoder." Therefore, the Office Action fails to disclose *aprima facie* case of obviousness.
>
> Quigley discloses a "burst receiver" in FIG. 9. According to Quigley,
>
>> incoming radio frequency (IN RF) signals are introduced on a line 460 to a down convert stage 514 which converts the signals to an intermediate frequency. The signals then pass to a demodulator 448 which recovers the modulated data. The signals from the data demodulator 448 are introduced to an equalizer 453.
>>
>> *(see,* Quigley, col. 27, lines 10-17).
>>
>> The signals from the equalizer 453 are introduced to a de-randomizer 275. The de-randomizer 275 de-interleaves the signals which have been previously interleaved at the subscriber modem 12 to prevent data from the subscriber from being lost as a result of noise in the cable. The de-randomized signals then pass to a Reed-Solomon (RS) decoder 524 which corrects for errors in the packets. The signals then pass through MAC 60 ... to an output line 526.
>>
>> *(see,* Quigley, col. 27, lines 49-57).
>
> Thus, Quigley at most only teaches or suggests a single decoder, namely the Reed-Solomon (RS) decoder 524 in the burst receiver of FIG. 3.
>
> From the discussion above in regards to claim 1, Alessi merely discloses a type of error correction code, namely a TPC code. Hence, combining the Reed-Solomon (RS) decoder 524 of Quigley with the TPC of Alessi at most teaches or suggests *a single TPC decoder.* In contrast, claim 14 recites more than one decoding step. A first decoding step of "turbo decoding the QPSK output signal" followed by a second decoding step of "decoding the turbo decoded output signal by a Reed-Solomon (RS) decoder." Clearly, the aforementioned combination of Quigley and Alessi does not teach or suggest "turbo decoding the QPSK output signal" followed by "decoding the turbo decoded output signal by a Reed-Solomon (RS) decoder" as recited by claim 14. In other words, there is no teaching or suggestion in neither Quigley nor Alessi to combine the Reed-Solomon (RS) decoder 524 with the TPC of Alessi to produce more than one decoder, the combination of Quigley and Alessi at most teaches or suggests a single decoder.

> Hence, the combination of Quigley and Alessi does not teach or suggest each and every feature of claim 14. Therefore, the Office Action fails to disclose a *prima facie* case of obviousness. Dependent claims 15-17 are likewise not rendered obvious by the combination of Quigley and Alessi for the same reasons as claim 14 from which they respectively depend and further in view of their own respective features. Accordingly, Applicants respectfully request that the rejection of claims 14-17 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

The examiner respectfully disagrees. Alessi et al discloses “The DOCSIS standard should be enhanced to allow for the implementation of additional FEC schemes such as Turbo Product Codes. However, to provide efficient operation in a variety of environments, DOCSIS should allow for a variable FEC scheme that can adapt to the immediate RF environment and can use different techniques as appropriate." (Conclusions and Recommendations) Alessi et al indicates the DOCSIS would be improved by using Turbo Product codes or Turbo decoding within a FEC component or decoder. Alessi et al also indicates improving the DOCSIS further by incorporating a variable FEC scheme allow for use of different techniques when appropriate. As explained in the "Error Correction for DOCSIS Application to SGLIU" section, Turbo Product Codes perform remarkably well within high BER environments. Thus, by having a variable FEC scheme for performing different techniques when appropriate, and given a high BER environment, Turbo Product Codes or Turbo decoding can be used for error correction for better performance. This section als shows different schemes that can be used, iteratively, to error correct the received signal. Table 1 and the paragraph below explains a 3D Hamming-Hamming-Hamming code used for decoding and its associated BER rate. This indicates combinations of FEC methods can be used for the desired BER rate. Thus, incorporating a Turbo decoder as disclosed by Alessi

et al to the Reed-Solomon decoder as disclosed by Quigley can be one of the variable schemes used to accomadate an environment that would require more powerful coding. It would also be obvious to one skilled in the art to combine a Turbo decoder as indicated by Alessi et al into Quiley's invention so to improve the DOCSIS by performing different techniques specifically for different environments, such as Turbo Product Codes or Turbo decoding within a high BER environment, thus adding variety to the decoder as well as efficient operation in a variety of environments, increasing the probability of error correcting the signal received.

Based on the rebuttal above, the rejection of claim 14 stands as stated. A copy is provided below.

7. Regarding **claims 15-17**, the applicant contends the combination of the prior arts does not render claim 1 obvious, thus the dependent claims is likewise not rendered obvious.

The examiner respectfully disagrees. As per the rebuttal stated above, Alessi et al and Quigley et al, in combination, disclose all recited limitations of claim 14. Thus, the rejection stated in office action mailed 6/27/2008 stands as stated. A copy is provided below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. **Claims 1-3** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fielding et al (US Patent No.: 6097706) in view of Brooks et al (US Publication No.: 20010039600) in view of Alessi et al (Publication Title: “Adapting the DOCSIS Protocols for Military Point to Multipoint Wireless Links”).

a. **Claim 1**,

i. Fielding et al discloses

- “a satellite earth station operably coupled to at least one data network” (Fig. 1, labels 12,10, Col. 1, lines 51-54) and
- “a plurality of satellite modems” (Fig. 1, labels 11-14),
- “each satellite modem of the plurality of satellite modems communicating in an upstream and downstream data communication mode with the satellite earth station via at least one servicing satellite” (Fig. 1, labels 11-14 would have satellite modems and label 30 as the servicing satellite).

ii. Fielding et al fails to disclose the components of the satellite modem.

iii. Brooks et al discloses

- “a host processor for receiving data packets from the at least one data network and processing the Data Over Cable Service Interface Specification (DOCSIS) management packets” (Fig. 1, labels 126,128,130,132 as data network links. Fig. 1, labels 102,104,122, paragraphs 37,38,40 any of which can be considered host processors

as defined in the limitations. Paragraph 24 discloses the cable modem device 100 permits MAC functions to be programmed to support evolving standards such as DOCSIS.),

- “a DOCSIS Media Access Control (MAC) coupled to the host processor for encrypting the transmit packet data from the host memory, framing data in MAC headers and inserting MAC timestamps in the transmit packet data” (Paragraph 24 discloses the cable modem device 100 permits MAC functions to be programmed to support evolving standards such as DOCSIS. Fig. 2, label 224, paragraph 42 discloses the functionalities of the MAC.)
- “a satellite modulator coupled to the DOCSIS MAC for modulating the encrypted transmit packet data to generate downstream output data for transmission to at least one of the plurality of satellite modems” (Fig. 2, label 118 as the modulator coupled to the MAC, label 224, Fig. 1, label 118 shows communication of the modulated output to cable media, wherein the cable media can be satellite communication as defined in paragraph 25.),
- “a burst demodulator for demodulating upstream data received from at least one of the plurality of satellite modems” (Fig. 2, label 114, Fig. 1, label 114 shows demodulating of the data from the cable media, wherein the cable media can be satellite communication as defined in paragraph 25.), and

- "a decoder coupled to the burst demodulator and the DOCSIS MAC for decoding the demodulated data from the burst demodulator and sending the decoded data to the DOCSIS MAC, wherein the DOCSIS MAC sends DOCSIS management packets portion of the decoded data to the host processor and sends transmit packet data portion of the decoded data to the at least one data network". (Fig. 2, label 220 as the decoder, label 114 as the demodulator, label 224 as the MAC, Fig. 2, label 224 shows the CMAC sending upstream data to the modulator and out to the cable media as shown in Fig. 1. Fig. 2 also shows label 224 sending data to the APB, which sends data to the ASB and host processors, labels 102,104,122)
- It would have been obvious to one skilled in the art to use the satellite modem as disclosed by Brooks et al in the satellite earth stations for communication within the overall system as shown by Fielding et al so to provide information to transmit and decode the received information within the satellite system.

iv. Fielding et al and Brooks et al fails to discloses a turbo decoder. Alessi et al discloses such a limitation. (page 83 section Error correction of DOCSIS Application to SGLIU.) It would have been obvious to one skilled in the art to use a turbo decoder in a DOCSIS application to satellite communication as disclosed by Alessi et al into Brooks et al so to provide high BER environments.

b. **Claim 2**, Brooks et al discloses "the data network is the Ethernet". (paragraph 25)

c. **Claim 3**, Alessi et al discloses "an RS Decoder for correcting errors of the decoded signal from the turbo decoder". (page 83, section Error Correction for DOCSIS Application to SGLIU discloses RS Viterbi codes are used wherein an RS decoder would be part of the turbo decoder.)

9. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Fielding et al in view of Brooks et al, further in view of Alessi et al as applied to claim 1 and further in view of Quigley et al (US Patent No.: 6650624).

a. **Claim 4**,

i. Fielding et al, Brooks et al and Alessi et al fails to disclose the limitations of claim 4.

ii. Quiley et al discloses

- "the DOCSIS MAC comprises: a SPI controller for supporting a downstream channel and at least one upstream channel" (Fig. 7a, label spi);
- "an encryption engine for encrypting the downstream data" (Fig. 7b, label upstream encryptor);
- "a decryption engine for decrypting the upstream data" (Fig. 7b, label downstream decryptor);

- "a formatter for formatting downstream data into Motion Picture Expert Group (MPEG) frames" (Fig. 6c, label downstream processor); and
- "a timing generator for inserting DOCSIS time stamps at programmable intervals" (Fig. 6c, label downstream processor). It would have been obvious to one skilled in the art at the time of the invention to use the DOCSIS Mac as disclosed by Quiley et al in Fielding et al in view of Brooks et al in view of Alessi et al's invention so to effectively process incoming and outgoing information.

10. **Claims 5,10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fielding et al in view of Brooks et al, further in view of Alessi et al as applied to claim 1 and further in view of Schmidl et al (US Publication No.: 20030206561).

   a. **Claim 5**,

      i. Fielding et al, Brooks et al and Alessi et al fails to disclose the components within the burst demodulator.

      ii. Schmidl et al discloses "an analog front end (AFE) circuit for accepting an analog input signal and generating a digital signal" (Fig. 10, label a/d)

         - "a digital filter coupled to the AFE circuit for filtering the digital signal" (Fig. 10, label filter);
         - "a quadrature amplitude (QAM) demodulator coupled to the digital filter for word detection of programmable length and pattern in a burst

preamble of the digital signal" (Fig. 10, label demodulation, paragraph 143)

- "an adaptive equalizer coupled to the QAM demodulator for characterizing a RF channel response" (Fig. 10, label demodulation, paragraph 143); and
- "a decoder coupled to the adaptive equalizer" (Fig. 10, label decoder)

iii. Schmidl et al fails to disclose a "forward error correction (FEC) decoder". Alessi et al discloses such a limitation. (page 83, section error correction for DOCSIS application to SGLIU discloses FEC RS Viterbi codes and section variable FEC) It would have been obvious to one skilled in the art to incorporate the burst demodulator components as disclosed by Schmidl et al into Fielding et al in view of Brooks et al in view of Alessi et al's invention to properly receive and decode information.

b. **Claim 10**,

i. Fielding et al, Brooks et al, and Alessi et al fails to disclose the limitations of claim 10.

ii. Schmidl et al discloses "dual analog-to-digital converters (ADCs) for sampling a baseband IQ analog waveform" (Fig. 10, label a/d)

- "phase/frequency recovery circuit coupled to the dual ADCs for recovering the phase and frequency of the sampled waveform"; (Fig. 10, label symbol timing acquisition)

- “a variable demodulator for demodulating the recovered signal” (Fig. 10, label demodulation)
- “a turbo decoding circuit coupled to the demodulator for turbo decoding of the modulated signal” (Fig. 10, label decoder).”

iii. Schmidl et al fails to disclose "a forward error correction (FEC) decoder coupled to the demodulator for FEC decoding of the modulated signal”.

iv. Alessi et al discloses such a limitation. (page 83, section error correction for DOCSIS application to SGLIU discloses FEC RS Viterbi codes and section variable FEC) It would have been obvious to one skilled in the art to incorporate the burst demodulator components as disclosed by Schmidl et al into Fielding et al in view of Brooks et al in view of Alessi et al's invention to properly receive and decode information.

11. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Fielding et al in view of Brooks et al, further in view of Alessi et al and further in view of Schmidl et al as applied to claim 5, further in view of Azenkot et al (US Patent No.: 7050419).

a. **Claim 6**, Fielding et al, Brooks, et al and Alessi et al fails to disclose “the FEC decoder comprises a programmable de-scrambler; a programmable reed-Solomon (RS) decoder; a byte deinterleaver; and FEC interface circuit”. Azenkot et al discloses such limitations. (Fig. 6, labels 244,246,128,248) It would have been obvious to one skilled in the art at the time of the invention to

use an FEC decoder as disclosed by Azenkot et al into Fielding et al in view of Brooks et al in view of Alessi et al's invention so to provide an efficient FEC decoder.

12. **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over Fielding et al in view of Brooks et al, further in view of Alessi et al and further in view of Schmidl et al as applied to claim 5, further in view of Geile (US Patent No.: 7310522).

    a. **Claim 7**,

        i. Fielding et al, Brooks et al and Alessi et al fails to disclose the limitations of claim 7.

        ii. Geile discloses “the adaptive equalizer includes an Ingress cancellation circuit for canceling ingress noise and removing inter-symbol interference”. (Fig. 26, label 112) It would have been obvious to one skilled in the art to use an Ingress filter as disclosed by in Fielding et al in view of Brooks et al in view of Alessi et al's invention so to eliminate ingress noise.

13. **Claims 8,9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fielding et al in view of Brooks et al, further in view of Alessi et al and further in view of Schmidl et al as applied to claim 5, further in view of Quiley et al (US Patent No.: 6650624).

    a. **Claim 8**, Fielding et al, Brooks et al, Alessi et al and Schmidl et al fails to disclose the limitation of claim 8. Quiley et al discloses “a microcontroller for

programming of the burst demodulator" (Fig. 9, label 520). It would have been obvious to one skilled in the art to adjust the burst demodulator as disclosed by Quiley et al in Fielding et al in view of Brooks et al in view of Alessi et al in view of Schmidl et al's invention to increase robustness.

b. **Claim 9**, Fielding et al, Brooks et al, Alessi et al and Schmidl et al fails to disclose the limitation of claim 9. Quiley et al discloses "a channel B input interface configured to accept a direct RF analog input" (Fig. 5b, label RF tuner).

14. **Claims 11-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fielding et al in view of Brooks et al, further in view of Alessi et al and further in view of Schmidl et al as applied to claim 10, further in view of Kim (Publication Title: "Turbo-coded OFDM System for a Mobile Satellite Broadcasting System").

a. **Claim 11**, Fielding et al, Brooks et al and Alessi et al fails to disclose the limitations of claim 11. Kim discloses "the turbo decoding circuit comprises: a Viterbi decoder, a synchronization and deinterleaver, and a reed-Solomon (RS) decoder." (Fig. 1b, label decoder 1, decoder 2, synchronization and deinterleaver) It would have been obvious to one skilled in the art at the time of the invention to incorporate the components as disclosed by Kim into Fielding et al in view of Brooks et al in view of Alessi et al's invention so to provide appropriate turbo decoding.

b. **Claim 12**, Schmidl et al discloses “a microcontroller for system configuration, control, and monitoring functions”. (Fig. 19a)

c. **Claim 13**, Brooks et al discloses “a downstream circuit coupled to the DOCSIS MAC for reformatting the data into a byte-wide stream and forwarding the bytes to the satellite modulator.” (Fig. 2, labels 224 and 118)

15. **Claims 18-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Brooks et al (US Publication No.: 20010039600) in view of Alessi et al (Publication Title: “Adapting the DOCSIS Protocols for Military Point to Multipoint Wireless Links”).

a. **Claim 18**,

i. Brooks et al discloses

- **“**a host computer coupled to a data network for receiving data packets from a data network and processing the Data Over Cable Service Interface Specification (DOCSIS) management packets” (Fig. 2, label ASB, paragraph 36)
- “a demodulator/Media Access Control (MAC) card coupled to the host processor” (Fig. 2, label 114 as the demodulator, label 224 as the MAC) “including a DOCSIS MAC coupled to the host computer” (Fig. 2, label abs and paragraph 36) “for encrypting transmit packet data from the data network responsive to the processed DOCSIS management packets from the host computer” (paragraph 42),

- "a burst demodulator for demodulating upstream data received from a satellite modem" (Fig. 2, label 114), and
- "a decoder coupled to the burst demodulator and the DOCSIS MAC for decoding the demodulated data from the burst demodulator and sending the decoded data to the DOCSIS MAC, wherein the DOCSIS MAC sends DOCSIS management packets portion of the decoded data to the host computer and sends transmit packet data portion of the decoded data to the data network"; (Fig. 2, label 220 as the decoder, label 114 as the demodulator, label 224 as the MAC, Fig. 2, label 224 shows the CMAC sending upstream data to the modulator and out to the cable media as shown in Fig. 1. Fig. 2 also shows label 224 sending data to the APB, which sends data to the ASB and host processors, labels 102,104,122) and
- "a satellite modulator coupled to the demodulator/MAC card for modulating the encrypted transmit packet data from the DOCSIS MAC to generate downstream output data for transmission to the satellite modem". (Fig. 2, label 118, paragraphs 25 and 42)

ii. Brooks et al fails to disclose "a turbo decoder".

iii. Alessi et al discloses such a limitation. (page 83 section Error correction of DOCSIS Application to SGLIU.) It would have been obvious to one skilled in the art to use a turbo decoder in a DOCSIS application to satellite

communication as disclosed by Alessi et al into Brooks et al so to provide high BER environments.

b. **Claim 19**, Brooks et al discloses “the demodulator/MAC card is embodied in a pluggable circuit board card resident in a PCI chassis and the host computer is a personal computer (PC). (paragraph 36)

c. **Claim 20**, Brooks et al discloses “the data network is the Ethernet” (paragraph 44).

d. **Claim 21**, Brooks et al discloses “the DOCSIS MAC and the PC communicate via a PCI bus”. (paragraph 36)

16. **Claims 14-17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Quiley et al (US Patent No.: 6650624) in view of Alessi et al (Publication Title: “Adapting the DOCSIS Protocols for Military Point to Multipoint Wireless Links”).

a. **Claim 14,**

i. Quiley et al discloses

- “receiving a radio frequency (RF) upstream signal” (Fig. 9, label RF)
- “demodulating the received RF signal to generate soft decision quadraphase-shift keying (QPSK) output signal” (Fig. 9, label 448, Col. 9, lines 18-21)
- “decoding the output signal by a Reed-Solomon (RS) decoder” (Fig. 9, label decoder);

- “assembling DOCSIS packets in the RS decoded signal” (Fig. 9, label 60, Fig. 7a shows a docsis and message processor); and
- “forwarding the assembled data to a data network” (Fig. 7a, label transmitter)

ii. Quiley et al fails to disclose “turbo decoding the output signal". Alessi discloses using a turbo decoder with RS decoding. (page 83, section Error correction of DOCSIS Application to SGLIU.) It would have been obvious to one skilled in the art to use a turbo decoder in a DOCSIS application to satellite communication as disclosed by Alessi et al into Quiley et al so to provide high BER environments.

b. **Claim 15**,

i. Quiley et al discloses

- “receiving DOCSIS-compliant data encoded with a Reed-Solomon encoding scheme from the data network” (Fig. 5b, label 263),
- “encoding the DOCSIS-compliant data” (Fig. 7b, label upstream encryptor);
- “generating baseband-frequency in-phase and quadrature-phase components of the encoded DOCSIS-compliant data” (Fig. 10, labels 538,540,462)
- “converting the encoded DOCSIS-compliant data to one or more analog signals for downstream satellite data transmission” (Fig. 21, label from

upstream channel, 1150 and label to Mac, , Fig. 5b, output from label 272)

ii. Quiley et al fails to disclose turbo encoding. Alessi discloses using a turbo decoder with RS decoding. (page 83, section Error correction of DOCSIS Application to SGLIU.) It would have been obvious to one skilled in the art to use a turbo decoder in a DOCSIS application to satellite communication as disclosed by Alessi et al into Quiley et al so to provide high BER environments.

c. **Claim 16**, Quiley et al discloses "interpolating the baseband-frequency in-phase and quadrature-phase components to a common sample rate that is higher than a plurality of DOCSIS-compliant bandwidth sample rates". (Fig. 82, label 351, Col. 74, lines 37-38)

d. **Claim 17**,

i. Quiley et al discloses

- "digitally pre-compensating the common sample rate baseband-frequency in-phase and quadrature-phase components for impairments encountered in one or more subsequent processes" (Fig. 87);
- "converting digitally pre-compensated common sample rate baseband-frequency in-phase and quadrature-phase components to one or more analog signals" (Fig. 61, label analog front end)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Linda Wong whose telephone number is 571-272-6044. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on (571) 272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Linda Wong
9/30/2008

/Kevin M. Burd/
Primary Examiner, Art Unit 2611